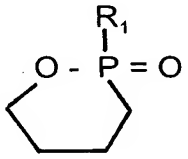
Claims

1. A method for producing a homopolyester or copolyester obtainable from at least one corresponding cyclic monomer, wherein the polymerization of the starting compound(s) is carried out in the presence of an initiator, selected from organo-tin compounds as well as tin carboxylates and tin alkoxides of the oxidation state II or IV that may contain optionally also hydroxy groups, and optionally in the presence of organo-soluble metal compounds of the group IV of the transition metals, in particular, titanium compounds and/or zirconium compounds, characterized in that to the mixture, at the latest at the point in time when the desired degree of polymerization is reached, a phosphinic acid and/or a phosphinic derivative of the formula (I)

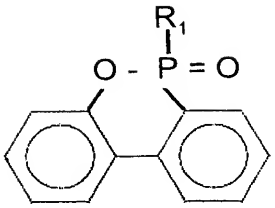
$$(R_1)\,(R_2)\,P\,(=O)\,X \qquad (I)$$

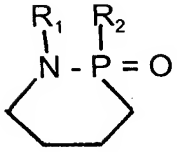
is added, wherein $R_1$ and $R_2$ each are independently of one another hydrogen, alkyl, aryl, or hetero aryl, and X is $-OR_3$ or $-NR_1R_2$, wherein $R_3$ is hydrogen, alkyl, aryl, $M^I$ or ½ $M^{II}$ and $M^I$ is an alkali metal ion and $M^{II}$ is an alkaline earth metal ion and wherein the substituents $R_1$ and $R_2$ have the meaning indicated above.

2. The method according to claim 1, wherein the substituents $R_2$ and $R_3$ or the substituents $R_1$ and $R_2$ of the formula (I) together with the phosphorus and optionally together with the nitrogen atom or oxygen atom form a saturated or unsaturated heterocyclic compound, and in particular formula (I) has the following meaning:



$R_1$ : H, alkyl, aryl, hetero aryl





3. The method according to one of the claims 1 or 2, characterized in that the molar ratio of initiator to the phosphinic acid and/or the phosphinic derivative of the formula (I) is 1:1 to 10:1, preferably approximately 2:1.

4. The method according to one of the preceding claims, characterized in that the phosphinic acid and/or the phosphinic derivative of the formula (I) is selected from the group of alky phosphinic acid, dialkyl phosphinic acids aryl phosphinic acid, diaryl phosphinic acid, and alkyl aryl phosphinic acid.

5. The method according to claim 4, characterized in that 9,10-dihydro-9-oxa-10-phosphaphenanthrene-10-oxide is used as the aryl phosphinic acid ester or that 2-methyl-2-(9,10-dihydro-9-oxa-10-phosphaphenanthrene-10-oxide) succinic acid is used as the alkyl aryl phosphinic acid ester.

6. The method according to one of the preceding claims, characterized in that the starting compound(s) is/are selected from cyclic esters, in particular, from ε-caprolactone, 1,3-dioxane-2-one (trimethylene carbonate) and 1,4-dioxane-2-one (glycol ester of acetic acid) and cyclic diesters, in particular. from 1,4-dioxane-2,5-dione (diglycolide) and L,L-, D,L- or meso-3,6-dimethyl-

1,4-dioxane-2,5-dione (dilactide), and mixtures thereof.

7. The method according to one of the preceding claims, characterized in that the compound of the formula (i) is added only at the time when the polymerization reaction is essentially completed.

8. The method according to one of the preceding claims, characterized in that the compound of the formula (I) is added as a pure substance, in solution or in the form of a master batch.

9. The method according to one of the preceding claims, as a continuous method carried out in an extruder, characterized in that the compound of the formula (I) is fed into the extruder at a short distance upstream of the discharge zone.

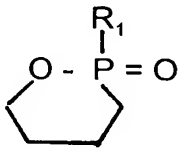
10. A method for stabilizing the melt of a homopolyester or copolyester obtainable from at least one corresponding cyclic monomer, wherein the polymerization of the starting compound(s) was carried out in the presence of an initiator, selected from organo-tin compounds as well as tin carboxylates and tin alkoxides of the oxidation state II or IV that may contain optionally also hydroxy groups, optionally in the presence of organo-soluble metal compounds of the group IV of the transition metals, in particular, titanium compounds and/or zirconium compounds, characterized in that to the melt a phosphinic acid and/or a phosphinic derivative of the formula (I)

$$(R_1)\,(R_2)\,P\,(=O)\,X \qquad (I)$$

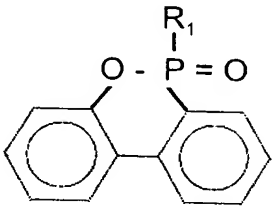
is added, wherein $R_1$ and $R_2$ each are independently of one another hydrogen, alkyl, aryl, or hetero aryl, and X is $-OR_3$ or $-NR_1R_2$, wherein $R_3$ is hydrogen, alkyl, aryl, $M^I$ or ½ $M^{II}$ and $M^I$ is an alkali metal ion and $M^{II}$ is an

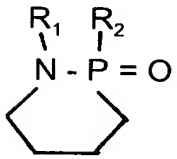
alkaline earth metal ion and the substituents $R_1$ and $R_2$ have the meaning indicated above.

11. The method according to claim 10, wherein the substituents $R_2$ and $R_3$ or the substituents $R_1$ and $R_2$ of the formula (I) together with the phosphorus and optionally together with the nitrogen atom or the oxygen atom form a saturated or unsaturated heterocyclic compound, and in particular formula (I) has the following meaning:



$R_1$ : H, alkyl, aryl, hetero aryl





12. The method according to one of the claims 10 or 11, characterized in that the molar ratio of initiator to the phosphinic acid and/or the phosphinic derivative of the formula (I) is 1:1 to 10:1, preferably approximately 2:1.

13. The method according to one of the claims 10 to 12, characterized in that the phosphinic acid and/or the phosphinic derivative of the formula (I) is selected from the group of alky phosphinic acid, dialkyl phosphinic acid, aryl phosphinic acid, diaryl phosphinic acid, and alkyl aryl phosphinic acid.

14. The method according to claim 13, characterized in that 9,10-dihydro-9-oxa-10-phosphaphenanthrene-10-oxide is used as the aryl phosphinic acid ester or that 2-methyl-2-(9,10-dihydro-9-oxa-10-phosphaphenanthrene-10-oxide) succinic acid is used as the alkyl aryl phosphinic acid ester.

15. The method according to one of the claims 10 to 14, characterized in that the starting compound(s) is/are selected from cyclic esters, in particular, from ε-caprolactone, 1,3-dioxane-2-one (trimethylene carbonate) and 1,4-dioxane-2-one (glycol ester of acetic acid) or the cyclic diesters 1,4-dioxane-2,5-dione (diglycolide) and L,L-, D,L- or meso-3,6-dimethyl-1,4-dioxane-2,5-dione (dilactide), and mixtures thereof.